REMARKS

Claim 5 remains the only in the application.

Reconsideration and withdrawal of the rejection of claim 5 under 35 U.S.C. 103(a) as being unpatentable over the English translation of Japanese patent 57-104650 in view of English abstract of Japanese patent 362112732, are respectfully requested.

As recited in claim 5 of the present application, the invention is directed to the manufacture of dual-phase steels with a two-phase microstructure of 70-90% ferrite and 30-10% martensite which is obtained by two-stage cooling after finishing-rolling, wherein cooling takes place slowly at first and then quickly. The first or slow cooling is carried out with a cooling rate of 20-30 K/s in such a way that the cooling curve enters the ferrite region with a temperature which is still so high that the ferrite formation can take place quickly and continues without limitations with respect to temperature limit values until at least 70% of the austenite have been transformed into ferrite. The second or rapid cooling follows the first cooling without intermediate stop.

Consequently, claim 5 of the present application does not claim the manufacture of dual-phase steels; however, claim 5

provides a clear teaching for a method which ensures that a dual-phase structure of at least 70-90% ferrite and 30-10% martensite is achieved.

The Japanese reference '650 cited by the Examiner describes the manufacture of a hot-rolled sheet steel with the stated object of obtaining a steel plate with superior formability and high strength values, wherein the reference discusses the permissible contents of the possible alloy elements C, Si, Mn, Cr, Al, S, Nb, V, Ti, Zr, Mo, Cu, Ni, P, Ca, rare earths. 19 different steel types with their contents of these alloy elements are listed in table 1.

All 19 steel types were initially slowly cooled beginning at a rolling end temperature of T_2 of 825°C. This slow cooling was carried out with a cooling rate C_1 of 20°C/sec. to T_3 600°C; subsequently, rapid cooling was carried out with a cooling rate C_2 of 60°C/sec. to a coil temperature T_4 which, depending on the steel type, was between 450 and 250°C.

A table 2 lists in altogether seven columns the strength and formabilities and in one column the structures which were obtained with the above-described cooling. In the steel types 4-8 referred to by the Examiner, the following values resulted for the obtained structure:

Steel No. 4 F + 80% M

Steel No. 5 F + 15% M

Steel No. 6 F + 10% M

Steel No. 7 F + 20% M

Steel No. 8 F + 25% M.

Consequently, the martensite content desired in accordance with the present invention was at least reached in steel types 5-8. However, depending on the given compositions of the steels, values which deviate significantly were also obtained.

Steel No. 9 F + 5% M

Steel No. 10 F + 50% M

Steel No. 15 and 16 F + P.

Table 2 does not make clear whether other structural components are contained in the cooled steel in addition to the mentioned structural components. In addition, the description of table 2 primarily only discusses the obtained steel properties and less the obtained structures. This is understandable because the Japanese reference '650 is mainly directed to obtaining certain strength properties; the obtained structure is of secondary importance in the reference.

Consequently, in accordance with table 2 and the method steps described in connection with table 2, an exclusively dual-phase structure of at least 70-90% ferrite and 30-10% martensite is not achieved in all cases as is true in accordance with the invention; rather, the structure is only obtained within wide limits as a side product when using the given cooling parameters in dependence on the alloying elements contained in the steel. As is made clear by table 2, the method of the Japanese reference also produces values which deviate significantly from the limits according to the present invention. Even when using the parameters stated in the only method claim, i.e., claim 5,

(T_2) from 800 to 900°C

(C_1) between 5 and 80°C/sec.

(T_3) between the Ar_1-point and 550°C

(C_2) from 80°C/sec. or more

(T^4) between 350 and 500°C,

the possible variation width with respect to the structure will not change because, contrary to the clear method steps recited in claim 5 of the present application, the user has a much wider range of method steps available.

Accordingly, the clear recitation of method steps for achieving a structural transformation according to the present invention is not provided by the Japanese reference which is

directed to cooling towards a temperature limit. In particular, the Japanese reference does not disclose or suggest the method step of claim 5 of the present application in which the cooling curve enters the ferrite region with a temperature which is still so high that the ferrite formation can take place quickly.

Applicant respectfully submits that even when the reference discussed above is combined with Japanese reference '732, the prior art relied on by the Examiner does not disclose or suggest the present invention as claimed in claim 5. This is because the reference does not disclose the clear teaching of the present invention according to which the second cooling is to begin only after at least a ferrite content of 70% has been reached. The reference, on the other hand, exclusively describes controlled cooling by means of several spraying headers. Clearly, the knowledge of this type of cooling as disclosed by the reference does not motivate those skilled in the art to forgo the method steps provided by the Japanese reference '650 with defined cooling parameters and to carry out the first cooling always until a degree of transformation has been reached.

For the reasons set forth above, applicant respectfully submits that claim 5 of the present application is patentable over the prior art of record.

Therefore, in view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Any additional fees or charges required at this time in connection with the application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on December 22, 2003.

By: _____ Date: December 22, 2003
Friedrich Kueffner